DOCUMENT RESUME

ED 432 733 CS 013 652

AUTHOR Corso, Marjorie
TITLE Children Who Desperately Want To Read, But Are Not Working at Grade Level: Use Movement Patterns As "Windows" To Discover Why. Part II: The Transverse Midline.
PUB DATE 1999-08-00
NOTE 17p.; For Part I, see ED 402 549; for Part III, see CS 013 695; for Part IV, see CS 013 696.
PUB TYPE Reports - Research (143)
EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Brain; Classroom Techniques; Comparative Analysis; *Learning Processes; Longitudinal Studies; *Movement Education; Primary Education; *Psychomotor Skills; *Reading Difficulties
IDENTIFIERS Developmental Theory

ABSTRACT

This paper discusses a multi-part longitudinal study which compared the developmental movement levels and the academic learning level in young children, noting that the relationship between movement education and academic education is based on the assumption that both realms of learning are dependent on the adequate development of the brain. The paper states that the focus in this part of the study is on the transverse midline. It explains that the concept of body-space awareness is that the transverse midline divides the upper part of the body from the lower part of the body; in paper-space awareness the transverse midline divides the upper half of the paper from the bottom half of the paper. The paper reports that there are some children in every primary classroom who desperately want to learn to read and write, but they are not working up to grade level. This study suggests that children who have not mastered the coordination of their arms and legs in movement patterns have poor work habits and poor organizational skills in the classroom. The paper describes the process of developing the physiology of the brain and nervous system by starting with large muscle movements and proceeding to the small muscle movements. It also suggests how classroom teachers should proceed with children with organizational problems and outlines the types of activities and skills these children should practice. Contains several illustrations and 21 references. (NKA)

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Children who desperately want to read, but are not working at grade level: Use movement patterns as "windows" to discover why.

Part II

The Transverse Midline

Marjorie Corso, Ed.
INSIGHTS TO SCHOOL READINESS
1933 County Road 782
Woodland Park, CO 80863
e-mail marjoriecorso@hotmail.com

CS 013 652

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Children, who desperately want to read, but are not working at grade level:
Use movement patterns as "windows" to discover why

Marjorie Corso, Ed.D

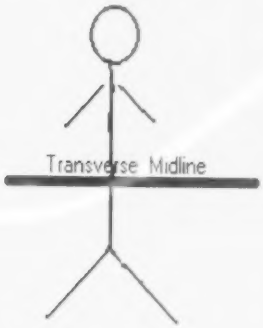
Part II

Transverse Midline

This is a discussion of a longitudinal study comparing the developmental movement levels and the academic learning levels in young children. The relationship between movement education and academic education is based on the assumption that both realms of learning are dependent on the adequate development of the brain.

The focus of Part II is on the transverse midline. The concept of body-space awareness is that the transverse midline divides the upper part of the body from the lower part of the body. In paper-space awareness, the transverse midline divides the upper half of the paper from the bottom half of the paper.

Body-space Awareness



Paper-space Awareness

This study suggests that the children who have not mastered the co-ordination of their arms and legs in movement patterns, have poor work habits and poor organizational skills in the academic classroom.

Review of the description of participants

There are some children in every primary classroom who desperately want to learn to read and write, but they are not working up to grade level. They do not qualify for learning disability services. There is no medical or prenatal explanation. They have loving, supportive parents. They are a "mystery" and a "worry" to conscientious parents and teachers.

Review of the academic classroom

Academic learning traditionally uses the sensory pathways of the brain and nervous system to expose children to knowledge. The knowledge is stored in the brain. The knowledge is mastered when the children can reproduce the knowledge through the small muscle movements used in reading and writing, or by verbally communicating some indication that the knowledge has been learned and understood. As these motor patterns become automatic the children are considered to be learning to read, write, spell, and perform math skills at their highest potential.

A problem occurs when the children can not communicate through the fine motor skills (reading, writing, or verbally) that the knowledge has been learned. Is the knowledge stored in the brain but the motor neurons are not developed enough to allow the child's fine motor skills to communicate the knowledge? Or are the two hemispheres of the brain not communicating efficiently?

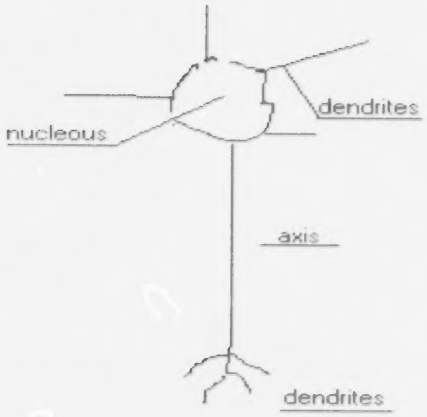
Review of the physical education classroom

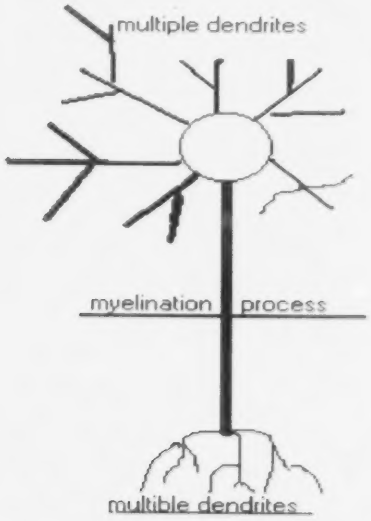
Movement education, also, uses the sensory pathways of the brain and nervous system to expose the children to knowledge. However, the learning levels can actually be observed through large and small muscle movement patterns. The teacher can visually evaluate the developmental levels of the children and can choose the methods of teaching needed to help the children's learning process.

The development of the brain and nervous system reaches mature motor patterns through use. This learning process is accomplished through the myelination process of the neurons and by increasing the number of dendrites on the neurons.

The myelination process is completed through the repeated use of the neuron. The myelin is formed on the axis of each neuron with repeated use. It insulates the axis so that impulses may travel faster to their destination. (VanDeGraaff, 1984)

The Physiology of the Learning Process





The number of dendrites associated with a neuron is, also, increased through repeated use of the neuron. The increase in the number of dendrites allows for more rapid interactions between the neurons at each synapse. (VanDeGraaff, 1984)

The parallel

In this study, a parallel was documented by compiling the results of the demographic data, the Neurological Organization (Delacato) forms completed by the parents, the developmental physical skills recorded on video-tape by the physical educator, and the report cards completed by the classroom teachers.

There was a parallel between the difficulty found in the children's co-ordination of their arms and legs and their need for improvement in organizational skills, work habits, and/or a disruptive behavior during transitions from one activity to another.

Completion of the learning process is demonstrated in physical education classes by performing mature motor patterns as defined by Gallahue (1993). In academic classrooms the learning process is reflected in organizational skills, efficient work habits, and smooth transitions from one activity to another.

Therefore, the logical process to develop the physiology of the brain and nervous system is to start with large muscle movements (walk, run, throw, strike, etc.) and continually develop the small muscle movements (writing, reading, speaking, etc.).

(1) Each eye has six muscles that need to be exercised to develop visual motor patterns. To the classroom teacher visual tracking means that a child can visually track a sentence from left to right and then reset right to left. It is important, also, that the eyes can track the written word from the top to the bottom of the page. These activities require the small muscle movements of the eyes.

The amount of time spent watching television and working on computers has affected the children's ability to visually scan the paper-space with the focus of the eyes stopping at the upper left-hand corner. This corner is where reading begins.

A solution to the problem may be the simple Dot-To-Dot page. It requires the eyes to scan the entire paper-space repeatedly to complete drawing the lines between a sequence of numbers or of the alphabet.

To the physical educator visual tracking is recognized if a child can throw an object to a target, if he can catch a ball, strike an object, or move into a position to perform the above skills. These skills require both the large motor patterns of the arms and legs and the small muscle patterns of the eyes.

If a child is not visually tracking objects in the gym, it is almost certain that he can not track the written word in the academic classroom.

(2) The transverse midline was used to evaluate the co-ordination of mature arm swings with locomotor skills, i.e., (walking, running, skipping, kicking).

Many of these children who were targeted for this study, could not demonstrate a mature walking pattern with the co-ordination of mature arm swings.

The demographic data revealed that these children spent time in baby walkers. Baby-walkers tend to develop the calves of the children's legs and result in "toe-walkers" because of the tightness of the calf muscles as described in Part I of this study.

Even more detrimental to the children's development, is the fact that the children who used the baby-walkers rested their arms on the tray and, therefore, they did not develop the arm swing for a mature motor pattern.

The lack of the mature arm swing can be attributed, also, to role models. It appeared difficult to find a teacher or parent who had a mature arm swing because of either holding a purse or a child's hand while walking.

(3) The transverse midline was used to evaluate the co-ordination of mature leg movements with manipulative skills. The children who could not use mature leg movements with an overhand throw (a baseball throw) or an underhand throw (pitching or bowling) were flagged as not crossing the transverse midline.

It seemed apparent that the children were not taught to use the entire body when performing manipulative skills. However, children who played youth sports were more likely to have developed mature motor skills as described by Gallahue (1993) than children who were not participating in youth sport activities. These mature motor patterns were sport-specific.

(4) The evaluation of the transverse midline, also, emphasized a problem with the co-ordination of arms and legs when striking an object with a racquet, bat, hand, or foot (tennis, softball, volleyball or soccer). The study concluded again that children who participated in youth sport were more likely to have developed mature motor patterns specific to their sport. Whereas, children who were not involved in youth sport, had not developed mature motor patterns while striking an object.

(5) During individual evaluations, the movement educator noted that the children hurried through activity challenges that are uncomfortable to them as if the skill was a threat to their self-esteem. (Corso, 1994)

"Are you finished already?" was commonly heard from both the physical educators and the academic teachers.

The physical educator, also, reported that the targeted participants were very slow in performing transitions from one activity to another activity. When given directions to change activities or directions to change equipment, there was little response from these children. It was described as if the children did not hear the directions or, perhaps, did not understand the directions.

At the same time the classroom teachers reported that the same children had problems: (1) following directions, (2) beginning tasks, (3) staying on task and (4) demonstrating organizational skills. Furthermore, the children's behavior was described as disruptive when directed to get their books, paper and pencils ready for the next lesson.

What should academic classroom teachers look for?

Paul Dennison of the Educational Kinesiology Foundation states:

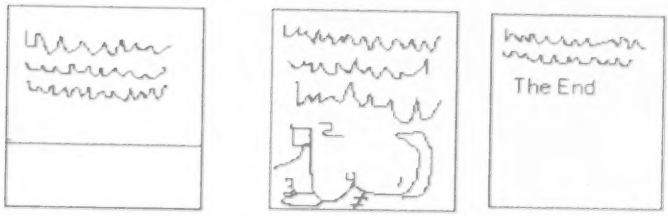
> Other children are easily overwhelmed by their work. They can't seem to decide what to do first. Others experience difficulty with games and sport because they can't organize their arm and leg movements in the proper order. Poor co-ordination and organization make writing and copying very difficult tasks. These students have trouble integrating the active part of the brain at the bottom with the sequencing part of the brain at the top.

(1) Children who have organizational problems should be given an open area separate from their desks in which to keep and organize their materials. Especially if the student desks are front-loading desks because children who are mixed eye/hand dominant will lean to the dominant hand side to take out their supplies. Leaning to their dominant hand side leaves their non-dominant eye searching inside the desk for their materials. This presents a handicap to their organizational skills.

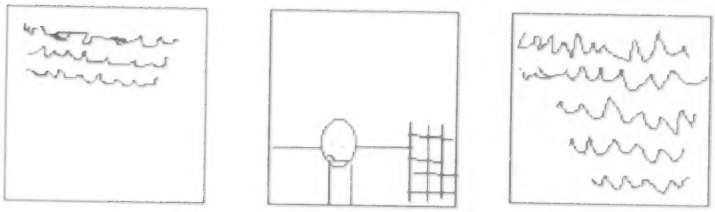
It is helpful to put a bright colored tape on the books, notebooks, pencils and other materials needed for a subject. The students can then search for all materials with red tape to prepare for reading or bright blue taped materials for math, etc. It is important, however, that the children have separate notebooks, pencils, etc. for each subject to emphasis the color scheme and to avoid confusion.

(2) Writing samples that were evaluated at this time showed that the targeted participants used only half of the paper-space without any signs that the other half of the paper-space existed. When questioned about using half of the paper-space, these children reported that they were not aware of the other areas.

Writing Samples



Crossing the Transverse Midline



Not crossing the Transverse Midline

Children who are crossing the transverse midline of the paper-space will communicate somehow that what is written is all they have to say on the matter. It can be a line drawn across the paper. It can be a picture drawn above or below the written area. It may simply say "The End."

Whereas, the children who are not crossing the transverse midline will simply stop with no clue as to if they wanted to say more nor not. Or they may draw a picture with no suggestion that there is paper-space that they have not used. The indentation on either the left or right margins may slant in continuously below the transverse midline, but return to the proper indentation spacing at the top of the next page.

Teachers should always question the children about their use of the paper-space; for example, when asked to write or read words in the neglected areas, the children said that it was too difficult because the words were too small and "fuzzy." They may be surprised to find the paper-space as if they never noticed the area before. As the children began to use the neglected areas, the teachers reported that their writing was sloppy in the previously neglected areas.

(3) Delacato's Neurological Organization Evaluations which were completed by the parents at home suggested that the children who did not cross the transitional midline did not pass following skills: (a) cross pattern creeping, (b) applying uniform slant to letters and writing from left to right, (c) cross pattern walking, (d) eye tracking movements vertically, and (e) writing/crayoning positions including the head position and the paper position.

Sponge activities for in the classroom and in the gymnasium

These are activities that classroom teachers can use in an academic classroom when children go "brain dead" and just look at the teacher with a blank stare. Contrary to popular belief, "moving and doing" do not need to be noisy. Noise accompanying fun is a myth that has emerged from spectator sports.

To stimulate the children's brain and nervous is to increase their attention span and to bring the children back on task. It is best to describe the activity verbally and not to demonstrate it. This way the teacher can better interpret the movements of the targeted participants.

Locomotor skills

(1) Does the child execute good rhythmic arm swings while walking in the hallway? Remember that the children are best observed from the back of the line. The children know the way to the library, etc., so permit them to lead the line.

(2) Stretching exercises like pushing the ceiling up as high as possible with both hands and then pushing the floor down with the palms while keeping straight legs. Repeat several times breathing in with ceiling push and exhaling with floor push.

(3) Hand Jives such as Patti cake, Patti cake or Peas, Porridge Hot are excellent activities that cross midlines. The children will know several hand jives to share with the class.

It is best to introduce new hand jives while the children are sitting on the floor with legs crossed because it frees the brain to learn more. Later, ask the children to repeat the hand jives standing up and, finally, ask the children to perform the hand jives walking forward, backward and sideward.

(4) Learning vocabulary can exercise the brain while moving. Put each of the following words on a separate card: over, under, around and through. Ask the children to say the word, spell the word out loud, and perform the action. They should be permitted to climb silently over or under a chair or desk with good body control. They should be encouraged to walk or crawl on their hands and knees around their personal space.

Walking through something may require two friends making an arch or the child clasping his hands together to form a "o" with his arms and carefully stepping one foot and then the other foot into the "o." When this action becomes comfortable ask them to step into the "o" with one foot and then the other foot and then step out with one foot and then the other foot.

(5) Give the children two pieces of crepe paper and encourage them to make circles, straight lines, and figure eights over their heads and then between their legs, or around their bodies.

(6) Use groups of children to learn math concepts, for example, 2+2 = 4. Ask the children to perform the equation with friends. Encourage them to physically walk through the problem of taking two people and adding two more people and then have them count how many people are in the answer group.

When appropriate, ask them to subtract two from the group and count how many children make up the answer. Remember that the physical movement is what the teacher needs to observe while concentrating on the targeted children.

(7) On the playground teach a social studies unit by learning the 50 States. Simply laminate a map of the United States. Write each State on a 3x5 card. Purchase a pair of bright yellow or orange work gloves. Choose two people to be the chasers. Each chaser wears one glove.

The tag game is simple. If a chaser tags a child, she must come to you. You give her a card with a State name on it and she must match it up with the State on the United States map. When the children master this game, try putting the capitols of the States on the 3x5 cards.

(8) Put each month of the year on a card. Instruct the children to stand tall with their arms over their heads when the month of their birthday is shown. Next time ask them to touch the floor with two hands when their birth month is shown.

(9) Put sight words on 3x5 cards and show each child a word. If he can read the word, allow the child to line up.

This activity places an added incentive to non-readers, especially when the teacher uses it to line up for recess, music, art, or physical education.

Synopsis of Part III

The Frontal Midline

The parallel

The academic teacher may see these children as continually trying to read or write from the right side of the paper to the left side. Some of these children can draw a happy face for the teacher upside down. When asked why they drew the face that way, the children said that they wanted it to look at the teacher.

Letter reversals are consistently present in these children's writings. The printed and cursive letters that begin with a straight vertical line are usually written backwards.

These children, also, tend to stand in line backwards and/or sit in their chairs backwards. They tend to get out of their chairs often and, if permitted, prefer to lie on the floor while reading.

The physical educator sees these children as always preferring to move backwards. They find it much easier to move sit-scooters backwards, to walk backwards on a balance beam, to stand in line backwards, and they have a tendency to try to go clockwise in a circle when the majority of the class is going counterclockwise.

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